Memorandum



Date: March 23, 2018

Subject: Lombardy Drive Green Stormwater Infrastructure Conceptual Analysis

The Unified Government of Wyandotte County and Kansas City, Kansas (UG) is exploring options to relocate the existing combined sewer under homes on Lombardy Drive in Kansas City, Kansas. This project area is in the Jersey Creek combined sewer basin. As part of the proposed sewer relocation, Burns & McDonnell has evaluated potential green stormwater infrastructure (GSI) opportunities to remove stormwater tributary to the existing combined sewer system. This memorandum summarizes the conceptual plan for GSI improvements to capture stormwater separated as part of the Lombardy Drive proposed sewer relocation project.

Burns & McDonnell delineated drainage areas adjacent to the Lombardy Drive sewer relocation project area. This delineation included all area tributary to the existing combined sewer along Lombardy Drive and to the inlets along 22nd Street north of Tauromee Avenue. The tributary drainage area to the ravine south of Tauromee Avenue and south and east of Lombardy Drive was also delineated for consideration of locations for conceptual design of GSI improvements. Generally, these areas drain from the northwest to the southeast. The drainage areas are depicted in Figure 1-1. There was insufficient information to determine where the runoff generated by Wyandotte High School ties into the Lombardy Drive sewer system due to current improvements at the Wyandotte High School campus. Therefore, Burns & McDonnell evaluated two scenarios to frame the possible GSI solutions: 1) including the Wyandotte High School drainage area; and 2) excluding the Wyandotte High School drainage area. Runoff volumes associated with each design event (24-hour event) for each of the two scenarios are shown in **Table 1**.

Table 1: Runoff Volume

Design Event	Runoff Volume (ac-ft) [Scenario 1: Including Wyandotte High School Drainage Area]	Runoff Volume (ac-ft) [Scenario 2: Excluding Wyandotte High School Drainage Area]	
Water Quality Event	1.85	1.75	
1-year	3.89	3.67	
2-year	4.86	4.59	
5-year	6.15	5.82	
10-year	7.12	6.74	

Three conceptual green stormwater infrastructure locations were identified to provide stormwater storage in series. These locations include a low-lying area east of Lombardy Drive, referred to as the Lombardy Drive Basin, the ravine south of Lombardy Drive and east of 22nd Street referred to as the East Ravine Storage, and the ravine south of Tauromee Avenue and west of 22nd Street referred to as the West Ravine Storage. There is an existing culvert beneath 22nd Street which connects the proposed West Ravine Storage and East Ravine Storage areas. A target level of service has not been identified for sewer separation projects tributary to the combined sewer system in the UG. Therefore, storage areas were maximized to provide the highest, practical

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level of service. The locations of these proposed green stormwater infrastructure storage areas are shown in Figure 1-2 attached. To maximize the storage opportunity at the downstream end of the ravine, where water overtops Armstrong Avenue and enters the combined sewer system via curb inlets, the Lombardy Drive Basin footprint was expanded. The proposed Lombardy Drive Basin would require purchase of Parcel 909416, a vacant lot at 1825 Armstrong Avenue, and closure of 20th Street between Ann Avenue and Armstrong Avenue. The proposed storage volumes provided for each storage location are shown in **Table 2**.

Table 2: Green Stormwater Infrastructure Storage

Storage Locations	Storage Volume (ac-ft)	
Lombardy Drive Basin	5.74	
East Ravine Storage	0.72	
West Ravine Storage	0.81	
Total Storage	6.46	

Separate storm sewers would be required to route flow to the Lombardy Drive Basin and the East Ravine Storage area. The sizing for these proposed storm sewers, identified by level of service, is shown in **Table 3**.

Table 3: Proposed Storm Sewer Sizing

Level of Service	Lombardy Drive Basin Storm Sewer Size (in)	East Ravine Storm Sewer Size (in)	Lombardy Drive Basin Storm Sewer Size (in)	East Ravine Storm Sewer Size (in)
	Scenario 1 Including Wyandotte High		Scenario 2 Excluding Wyandotte High	
	School Drainage Area		School Drainage Area	
Water Quality Event	18	24	18	24
1-year	24	36	24	30
2-year	30	36	30	36
5-year	30	42	30	36
10-year	36	48	36	42

Based this conceptual analysis, the proposed storage provided by the Lomardy Drive Basin, East Ravine Storage, and West Ravine Storage can meet a 5-year level of service entire drainage area, including the Wyandotte High School drainage area (Scenario 1).

Attachment:

Figure 1-1: Drainage Areas

Figure 1-2: Proposed GSI Overview



